

- Figures 6a to 6e show screenshots from an embodiment of the invention illustrating use of map build code to construct a two-dimensional map for a three-dimensional first person shooter-type game environment for a game level;
- 5 Figures 7a to 7c show screenshots from a user interface for placing items within a 2D map representing a 3D virtual environment for a game;
- Figures 8a and 8b show screenshots of a lighting definition component of the user interface;
- 10 Figures 9a to 9c show examples of three-dimensional tiles in different tilesets which correspond to the same two-dimensional tile;
- 15 Figure 10 illustrates the main processes of user interface software for the map builder user interface;
- Figure 11 shows a data flow diagram illustrating the main data components used in building a map of a 3D virtual environment;
- 20 Figure 12 conceptually illustrates the joining of two tiles in three dimensions;
- Figure 13 shows an overview of a map compilation and game run process;
- Figures 14a and 14b show visual geometry for a double corridor tile;
- 25 FIGURES 15a AND 15b SHOW
~~FIGURE 15 shows~~ collision geometry and portal geometry for the double corridor tile of Figure 14; *JG*
- 30 Figures 16a and 16b show navigation pad positions and links for the double corridor tile of Figure 14;
- Figures 17a to 17d show, respectively, a 2D map and corresponding 3D game level geometry for a single double corridor tile and a pair of joined double corridor tiles; and

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FIGURES 18A AND 18B SHOW

Figure 18 shows a flow diagram of a method for processing tile data of two tiles of a tileset to join interfaces of the tiles to create a three-dimensional virtual environment for a game.

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DETAILED DESCRIPTION OF EMBODIMENTS

- Referring first to Figure 2, this shows a schematic illustration of the components in a computer system 200 which is suitable for implementing the present invention. The 10 computer system includes program memory 202 comprising map builder code to allow a user to build a map of 3D components for creating a virtual environment, map compiler code for compiling the map into 3D virtual environment data, and game engine code for processing the 3D virtual environment data and rendering the data into a screen viewport for playing a computer game. The game engine code also provides the 15 game functionality. As the skilled person will appreciate the map builder, map computer and game engine may comprise separate applications or may be combined, for example in a single application. Similarly the program code may be run on a single machine or distributed across a plurality of machines.
- 20 The program memory 202 is coupled to a processor 208 via a general purpose bus 224, to which is also coupled 3D graphics hardware 210 which provides an output to a display 212 such as a computer monitor or, for example via a SCART connection, a television. The processor 208 loads program code from program memory 202 and implements the code to provide a map builder 208a, a map compiler 208b and a game 25 engine 208c. Also present, but for reasons of clarity not illustrated in Figure 2, is computer operating software which may include driver software for the 3D graphics hardware 210 providing standard API call interfaces via Open GL or Direct 3D instructions.
- 30 The game engine 208c includes a rendering engine for rendering 3D graphics into a screen view port using 3D graphics hardware 210. The map compiler 208b may be part of game engine 208c although, preferably, a map compiler is also incorporated into map builder 208a to allow a user to preview the 3D environment specified by a map created

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